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## ON THE PREPARATION OF SKELETONS FOR MUSEUM PURPOSES.\*

BY PROFESSOR W. H. FLOWER, F.R.S.

EVERYONE who has a museum, however small, should be familiar with the mode of preparing skeletons. I can only indicate the outlines of the process, for in this, as in every other part of the work of making anatomical preparations, a few practical lessons from a person already an adept, and a little experience and observation, will do more than any description. When the principles are known, the details can be carried out with such modifications and improvements for each individual case as the skill and ingenuity of the operator can suggest. With regard to museum specimens generally, the question is frequently asked how such or such a preparation is made, and an answer is expected, in a few words, which will enable the questioner to do the same himself. This is much as if a novice who had never handled a brush were to ask an artist how he had painted his picture, and expect that a few simple directions would put him on a level with the master. Preparation-making is an art which can only be acquired by labour and perseverance, superadded to some natural qualifications not possessed in an equal degree by all.

To return to the bones, as in many respects the simplest kind of preparations. There is a popular notion that skeletons are made by putting animals into ant-hills. So I have been told over and over again ever since I was a child. I must, however, say that

\* From a Lecture delivered at the Loan Collection of Scientific Apparatus, South Kensington.

I have never actually seen, or even heard of, a skeleton really made in this way, though ants, doubtless, especially in hot countries, will make short work of the flesh of an animal's body, leaving at least all the larger bones untouched. But we must adopt some safer and more universally applicable method of proceeding. Another common idea is that some "chemical" substance is necessary to steep them in for dissolving the soft parts, and I am often asked, "What acid do you use for this purpose?" when a little reflection would have shown that the bones would be the first parts to disappear under the influence of such a menstruum. No, water—pure water—is the only thing required in preparing bones and skeletons in the great majority of cases, and in the proper use of the water the art of "macerating," as it is called, chiefly consists.

This process is nothing more or less than placing bones in water and leaving them undisturbed until putrefaction of all the flesh and blood remaining on and around them and within the hollows and small cavities of their interior, takes place, and these soft parts entirely lose their form and structure and become converted into liquids and gases mingled with the water or escaped from its surface; so that when the bones are removed and well washed, nothing remains but the comparatively indestructible true osseous tissue, which, when dried, is hard, clean, and without smell.

Maceration consists, then, essentially in the destruction of the soft tissues by putrefaction, and certain circumstances are essential or favourable to the success of the process. In the first place, the water should not be too abundant in proportion to the amount of animal matter to be destroyed. Then it should never be changed or disturbed until the process is completed. The surface should be exposed to the air, and the loss from evaporation supplied from time to time. The temperature should be uniform and elevated. Cold checks the process; freezing arrests it altogether. If the heat is too great the bones are often greasy and discoloured, as when they are prepared by boiling. It is to the fact that the process varies in rapidity according to so many circumstances that the chief practical difficulty, which is to know when it is completed, is due. If the bones are taken out too soon, unless they are returned immediately to the same water, a check takes place in their preparation. To estimate the necessary time is a matter acquired only by practice and knowledge of the surrounding circumstances. Much will

depend upon the size of the bones, small bones macerating much more rapidly than large ones; also upon their condition. If fresh they macerate far more quickly than if they have been previously dried (as is the case with skeletons sent from abroad in a rough state), or if they have been kept in spirits or any other preservative solution.

When the bones are to be removed, the water must be carefully poured off through a hair-sieve, and all the solid matter which remains at the bottom of the jar must be carefully searched for any of the smaller bones which might otherwise be lost. They are then removed to clean water, frequently changed for several days, well washed with a brush if necessary, and dried, if possible, in the sun.

The process of maceration is necessarily attended with disagreeable smells. So long as it continues, the surface of the water slowly emits gases; but the worst is when the water is stirred up by pouring it off to remove the bones. Hence it should be carried on in the open air, or, what is far better, in a building isolated for the purpose, and in which the temperature may be kept uniform. When maceration has to be conducted among dwellings, it is necessary to be very careful not to disturb the vessels, and to put some disinfectant, as chloride of lime, into them the day before the contents are taken out. This will obviate most of the usual disagreeable effects, and if not used in too great a quantity will not cause any material damage to the bones. But chloride of lime, when used too freely, is a dangerous agent; it destroys the gelatinous portion of the osseous tissue (which of course is not removed in maceration), and leaves the bones white, chalky, and friable. After proper maceration no chemical bleaching is required. Exposure to sunlight or alternate sun and rain for some months is generally good, especially for large solid bones, though this may be carried too far, as the intensely white, cracked, porous and fragile condition of osseous fragments which have been lying long on moors or hill-sides, shows. Bones are not naturally of a pure white colour, but have a delicate yellowish or creamy tint like that of ivory.

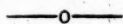
Several substitutes for the process of maceration in water are occasionally adopted under special circumstances:—

1. Boiling. This process has the advantage of rapidity, but is seldom resorted to except when absolutely necessary (as in the

case of the celebrated skeleton of the "Irish giant" in the Hunterian Museum), as the fatty matter in the medullary cavity is melted and pervades the whole osseous tissue, and generally leaves the bones discoloured and greasy, as may be seen in most of those that have been cooked for the table.

2. Burying in the ground may be resorted to when there are no conveniences for maceration, but it is even a slower process. The effect upon the bones is the same, but they are nearly always stained brown by the colouring matter in the soil, and the small ones are apt to get lost.

3. It has occurred to me, following out a suggestion of Mr. Seymour Haden's, in his excellent letters entitled 'Earth to Earth,' relating to the best mode of disposing of the dead, to clean bones by burying them in a basket of charcoal, and though the experiments are not quite complete they promise excellent results, especially as all the disagreeable odour of maceration is entirely obviated, and the process may even be carried on in inhabited rooms without any inconvenience.



#### BIRDS OBSERVED BETWEEN CAPE FAREWELL AND CAPE CLEAR.

BY H. W. FEILDEN, F.G.S., C.M.Z.S., &c.

IN the month of October, 1876, I sailed from Davis Strait for Ireland on board H.M.S. 'Alert.' We met with foul winds and dirty weather coming down the middle of the Strait, and strong baffling winds in the longitude of Cape Farewell, which accompanied us most of the way across the Atlantic. The greater part of the day was passed by me on deck, and the officers when on watch, knowing my proclivities, invariably called me when any bird out of the common came in sight. I think therefore that we noted amongst us most of the individuals that came near the ship during daylight. I have purposely avoided mentioning our daily latitude and longitude, as, to many persons who may not have a chart at hand, constant repetition of figures does not aid the memory, but has rather the contrary effect,—at least I know that is my experience,—but I have given the approximate distance



from the shores of Great Britain or Ireland, or some other land, our course across the Atlantic being made between the fifty-sixth and fifty-third parallels, or in about the latitude between Edinburgh and Dublin.

October 14th, 1876, about 300 miles S.W. of Cape Farewell and midway between Greenland and Labrador; wind N. by W. Fulmars in abundance, several small land birds flying about the ship. Amongst them I recognized Redpolls and Snow Buntings. During the afternoon a Short-eared Owl, *Asio accipitrinus*, lit on the rigging; then it flew several times round the ship, alighting with outspread wings on the water under the lee of the vessel, rested for a minute, and then rose again and flew off. This Owl is possessed of great powers of flight, and a passage from Greenland to the shores of the American continent must be a matter of small moment to it.

October 16th, 1684 miles from Portsmouth. Kittiwakes numerous around the ship, also Fulmars.

October 18th, 1088 miles from Cape Clear. A few Fulmars and some seven or eight Kittiwakes about the ship. Lieutenant Egerton, when on watch, saw a single Little Auk, the only one observed by us whilst crossing the Atlantic.

October 19th, 965 miles from Cape Clear; wind S. Kittiwakes numerous, the majority in immature plumage; a single *Puffinus major* following the ship.

October 20th; blowing a full gale from S.W. During the height of the storm Fulmars, Greater Shearwaters and Kittiwakes remained by the ship.

October 21st, 716 miles from Cape Clear. At mid-day Fulmars, Greater Shearwaters and Kittiwakes in attendance.

October 23rd; distance to Cape Clear 517 miles; wind changed to S.E. A Starling lit on the rigging, rested a few minutes, and then flew away to leeward. A Sanderling passed the ship in the same direction, also several small land birds. These had all evidently been blown out of their course by the south-east gale. Storm Petrel noticed for first time since leaving the ice. At noon our latitude was  $53^{\circ} 59'$ , and during the day the Fulmars which had attended us from Davis Strait left. It will be a curious fact in connection with the southward range of this species in the Atlantic if it can be shown that it does not pass south of the fifty-third parallel. In 1875, when bound for Greenland, on June 6th, we

were 170 miles west of Ireland and 360 miles S.W. of St. Kilda, in lat.  $53^{\circ} 51'$  N. On that day Fulmars surrounded the ship, and never left us again until we were past the north-water of Baffin Bay and embayed in the ice of Smith Sound. This observation of mine corroborates that of the late Professor Goodsir:—"Two days after we left Stromness, I noticed numbers of the Mollemoke or Fulmar Petrel, *Procellaria glacialis*, following us. When to the southward of lat.  $53^{\circ}$  they disappeared entirely; but whenever we were to the northward of that parallel, the whalers' constant companion, the 'Molly,' again made its appearance, and we were never without numbers of them to enliven us throughout the remainder of the voyage."\*

October 24th, 450 miles from Cape Clear; wind S.W. A Starling alighted on the ship during the morning watch, and was captured. Greater Shearwaters, Kittiwakes, and Storm Petrels in attendance.

October 25th, 255 miles from the Skelligs. A Snipe, *Scolopax gallinago*, seen by me, also several small land birds chirping about the upper rigging.

October 26th, 129 miles from the Skelligs. A Snipe and a Sky Lark came on board and were captured. Several Greater Shearwaters about.

October 27th. The Greater Shearwaters followed our ship to within ten miles of the coast of Kerry, and then we left them. When we were off the Great Skelligs, numerous parties of Manx Shearwaters passed the ship.

My belief is that the land birds we met with so far out in the Atlantic had been carried there by strong south-easterly gales. In all probability, before crossing half the width of the Atlantic, they would be met by westerly winds, the prevailing ones in that part of the ocean, and if not too worn out might again reach European land. It is not, however, difficult to imagine how such birds might be transported to Greenland.

\* 'Arctic Voyage,' R. A. Goodsir, 1850.

## ON THE OCCURRENCE OF THE HOBBY IN IRELAND.

BY THE EDITOR.

WHEN the late Mr. Thompson, of Belfast, published his 'Natural History of Ireland,' now more than five and twenty years ago, he evidently had some doubt as to the propriety of including the Hobby, *Falco subbuteo*, amongst the birds of his own country, and, with that accuracy which always characterized him, and which has rendered his work even to the present day the most reliable text-book on Irish Ornithology, he contented himself with the statement that it "has once at least been obtained in Ireland."

The specimen referred to was shot, as he informs us, at Carrig-rohan, near Cork, in the summer of 1822 (?), and a coloured drawing made at the time subsequently showed that the species had been correctly identified.

On referring to Prof. Newton's edition of Yarrell's 'British Birds,' now in course of publication, I find that only one other Irish specimen is noticed (vol. i. p. 66), namely, one in the Museum of the Royal Dublin Society, which was shot in June, 1867, in the county of Tipperary. As I am enabled to give the particulars of the capture of this specimen, and have notes on the occurrence in Ireland of three or four others, I think it may be as well to record them.

The last-mentioned bird was shot on the 6th June, 1867, while hawking for flies over the river at Moulfield, Clonmell, the seat of Mr. John Bagwell. Mr. H. B. Murray, of Heywood, Clonmell, who noticed the fact in 'The Field' of June 15th, 1867, and subsequently in 'The Field' of July 10th, 1869, remarked that the stomach of this bird contained nothing but the remains of small beetles and large flies—a circumstance fully confirmatory of what is known respecting the food and habits of this species.

Five years previously—namely, in May, 1862—a female Hobby was shot by the late Mr. Hall Dare's gamekeeper at Newtown Barry, County Wexford, and a male bird which was in company with it escaped. The pair had been observed to frequent a small fir wood in the neighbourhood, and in all probability would have nested there had they been allowed to remain undisturbed. This circumstance, which had been briefly mentioned in 'The Field' of the 20th December, 1862, was noticed in more detail by the late Edward Newman in 'The Field' of the 21st February, 1863.

Either the last-mentioned locality must be an attractive one to this species of hawk, or the keeper referred to is more than usually discriminating in his pursuit of so-called vermin, for in June, 1869, he shot another Hobby on the same property at Newtown Barry, and the owner, Mr. R. W. Hall Dare, not only forwarded a note of the occurrence, which was published in 'The Field' of July 3rd, 1869, but was good enough at the same time to send the bird for identification; so that any doubt which might have existed as to the species being correctly named by him was thereby removed.

On referring to his note, I find that allusion is made to a specimen of the Hobby in the Belfast Museum, but I learn from Mr. Douglas Ogilby that this is probably a mistake, since he has ascertained from Mr. Darragh, the Curator of the Museum in question, that the only example of *Falco subbuteo* in the collection is a badly stuffed specimen from the South of France.

In 'The Zoologist' for 1875 (p. 4537), Mr. John Sclater has recorded the capture of an adult female Hobby, which was shot by Mr. H. A. Hamilton at Balbriggan, County Dublin, on the 7th June, 1875, and was forwarded to him in the flesh. An examination of the contents of the stomach revealed the previously unsuspected fact that the Hobby sometimes preys upon bats, for two skulls with the under jaw-bones attached and some wing-bones of bats were brought to light.

For my own part, I am not much surprised at this, for the Hobby, like its congener, the Red-footed Falcon, seeks much of its prey at twilight, when moths and beetles are on the wing, and would therefore be likely at times to meet with bats. A flight at a Noctule with a Hobby would be a sight to gladden the eye of a falconer, and although this large bat flies so high, and is capable of turning very rapidly, I make no doubt that the Hobby could take it if so minded, for I have known this bird to pursue and overtake a Swallow—a much more nimble prey.

From the foregoing notes it would appear that there are at least five well-authenticated instances of the occurrence of the Hobby in Ireland, and it is not unreasonable to assume that others may have escaped observation. Greater attention being given now-a-days to Ornithology, and more exactness in the method of observing, it is not unlikely that Irish naturalists will find this bird to be a more frequent visitor in summer to Ireland than has been hitherto suspected.



## THE BIRDS OF THE BERMUDAS.

BY SAVILE G. REID, LIEUT. R.E., F.Z.S.\*

*Ortyx virginianus*, Virginian Partridge or Quail.—This bird, known to us on this side of the Atlantic as a comparatively recent introduction, under the name of Virginian "Colin," is *the* game-bird of Bermuda; but whether it originally found its way there from the American continent without the agency of man is doubtful. It is not mentioned by the old historians. It is certain, however, that, though common some few years previous to 1840, it became extinct in the islands from that year till 1858 or 1859, when, thanks to the enterprise of Mr. Richard Darrell, an importation took place from the United States. Several pairs were turned out, and these, increasing rapidly, soon spread over the islands to such an extent that the species may now once more be considered common. The manners and customs of this handsome bird are too well known for me to venture on details. From my notes, however, I extract the following, which may prove of interest. It is extremely prolific. Mr. Samuel Harvey told me of a nest near his garden containing eighteen eggs, every one of which hatched off; there are seldom less than twelve eggs in a nest; they sit in the cedar trees on wet days, and during the mid-day heat, roosting there at night. When once flushed they are very hard to put up a second time, even with good dogs, being able, according to popular superstition, to conceal their scent at will; they run rapidly, and squat closely in the thick sage-bush, the strong smell of which is calculated to puzzle a dog. Their call-note is triple, "hoo-woo-wooit," the "hoo" indistinct and audible for a short distance only. I don't think "Bob-White," the familiar American name, fairly represents the call; it is too sharp and well-defined. These birds are fond of the ripe berries of the sage and cedar; the latter give the flesh a decidedly unpleasant aromatic flavour. They also eat the sweet potatoes in small pieces. Great numbers of the young are destroyed by the swarm of cats which infest the islands. An old "coloured" lady once accosted a gallant officer of the 53rd Regiment, who was beating some likely ground near her cottage, and asked him what he was looking for. "Partridges!" cried she, with a sneer on her sable features, "I don't want a gun to get them. Why! my cat brings me in one every

\* Concluded from p. 424.

morning!" Cats, however, are not the only foes to be dreaded. The "coloured" sportsmen take the eggs and eat them, while a white "sportsman" resident on the islands was once overheard to say, "It's all very well for the officers; they get lots of practice,—can shoot Partridges at any time,—but the only time I can get them is when they have nests, and I can kill the old birds." No wonder the poor birds are kept down, and increase with lamentable slowness. If it were not that they are so hard to put up and shoot in a workmanlike manner (two brace being quite a "bag" in one day) their extermination would be a matter of a few years only.

*Squatarola helvetica*, Gray Plover.—Unlike the next species, this is by no means a frequent visitor to the Bermudas. One was killed, and another seen, by Major Wedderburn at Mangrove Bay in September, 1848. I shot one on the beach below the Sand-hills on the 5th, and another near Warwick Camp on the 13th November, 1874. Both these birds were alone.

*Charadrius virginicus*, American Golden Plover.—Dr. Coues is of opinion that the American bird cannot be specifically separated from the Asiatic *C. fulvus* (an undoubted specimen of which has been recently obtained in the Prybilov Islands). It can always be distinguished from our European *C. pluvialis* by its gray axillaries. An excellent account of the appearances of this species in Bermuda is given by Mr. Hurdis (Nat. in B., pp. 71—77), who goes carefully and thoroughly into the question of its wonderful migrations. Major Wedderburn says (p. 36), "During some years large flocks of these birds pass over the islands in the months of September and October; but, unless in stormy weather, they do not alight in any great numbers. I have seen it as early as the 21st August, 1847, at Ireland Island; again on the 25th July, 1848, at Hamilton. The latter was a single bird sitting on the road close to the house in which I lived; but by the time I got out it was gone. On the 9th March, 1852, one was shot in beautiful plumage, on the north shore; and this is the only instance of its appearing in spring." Numbers appeared in September, 1874, frequenting the grassy slopes of the north shore—their favourite haunt—and even the parade grounds, during the continuance of a three days' revolving gale. Many were shot, all in the mottled dress which procured for the species the specific name "*marmoratus*." Small flocks continued to arrive at intervals during the autumn, remaining only a few days in each case. I obtained specimens on the 14th and

23rd November in complete winter dress. The arrival of the Golden Plover in August or September is the beginning of the shooting season in Bermuda, and is eagerly looked for by the British officer, who forgets all the heat and discomfort of the summer in the pleasure of once again handling his gun and cartridges. And a nicely-cooked Golden Plover for breakfast is by no means to be despised, as those who have been trifling with tough fowls and doubtful eggs for months can well testify. The note of this species differs from that of *C. pluvialis*; it sounds like "wee-o-wee," sharply but clearly pronounced.

*Ægialitis vociferus*, Kildeer Plover.—The latest of the southward migrants, but regular in its visits. First seen about the middle of November, in small flocks, which remain till February, attaching themselves principally to the grassy bottoms and moist places on the south side. Persons living on this side hear their sweet wild note all night. A few remain till March, or even later.

*Ægialitis semipalmatus*, American Ringed Plover.—Arrives in small numbers early in August with the annual invading army of Stints and Sandpipers, remaining till October, and frequenting the sandy bays on the south shore, also the muddy edges of Peniston's Pond.

*Ægialitis melodus*, Piping Plover.—Rare. Major Wedderburn shot one at Mangrove Bay in September, 1848, and two were seen on a rocky island in Hamilton Harbour in September, 1850. Mr. Bartram has one specimen. Not observed in 1874.

*Streptilas interpres*, Turnstone.—This cosmopolitan species is a frequent visitor. It has been shot as early as the 3rd August. I obtained two on the 23rd December, 1874, but it probably remains all the winter.

*Himantopus nigricollis*, Black-necked Stilt.—The American representative of our *H. melanopterus*. Only one has occurred, shot at Warwick Pond on the 3rd June, 1853, by Mr. Hinson, and sent to Mr. Hurdis.

*Lobipes hyperboreus*, Northern Phalarope.—One found dead, floating in Riddle's Bay, March 21st, 1848, sent to Rev. H. B. Tristram. A female, partly in ruddy plumage, killed with a stick in Hamilton Harbour on the following day, and a third example captured on the edge of Devonshire Swamp by Mr. Hurdis on the 8th March, 1852. "It is remarkable that all the specimens were obtained without the aid of a gun" (Hurdis).

*Philohela minor*, American Woodcock.—“A single specimen was shot near Hamilton in October, 1842, and one was supposed to have been seen at Hungry Bay a few years afterwards by Mr. Fozard” (Nat. in B., p. 42).

*Gallinago Wilsonii*, American Snipe.—Usually makes its first appearance at the beginning of October, a straggler or two remaining till January, and occurs also in March, April and May in limited numbers on its northward journey. It has been seen as early as the 13th September (Hurdis). It seems rather a farce to talk of the snipe-shooting in Bermuda; but occasionally large flights come in, and really fair bags are made, such as six or nine couple a-day to two guns. Pembroke Marsh is the great place for them, and a few usually take up their quarters in Devonshire Swamp. They are very good eating at first, but soon become rank from feeding in the brackish mud. They lie closer than our European Snipe, and a dog is a *sine quâ non* in the thick scrub-grown marshes. Their note is very similar, but they differ somewhat in plumage, especially in having sixteen tail-feathers instead of fourteen like our bird.

*Gallinago media*, English Snipe.—We have Major Wedderburn's authority for the occurrence of this bird in Bermuda. He shot two in Pembroke Marsh in December, 1847.

*Macrorhamphus griseus*, Red-breasted Snipe.—One “shot by Capt. Orde on the 29th September, 1847, at Harris's Bay; another was killed by Mr. C. Fozard on the 21st August, 1848” (Nat. in B., p. 43). A third was obtained on Pearl Island on September 10th, 1874, by Capt. Kirkwood, 53rd Regiment. This specimen was preserved by Capt. Rooke, who kindly presented it to me. [Three others were shot by Lient. Festing, of the 20th Regiment, at Peniston's Pond, on the 17th September, 1875.—H. D.]

*Micropalama himantopus*, Long-legged Sandpiper.—Major Wedderburn killed two, one of which he unfortunately lost, in the beginning of August, 1848. [Lient. Festing shot one at Peniston's Pond early in September, 1875.—H. D.]

*Ereunetes pusillus*, Semipalmated Sandpiper.—A regular visitor, arriving about the 1st August, or a few days earlier, and found in small flocks in the sandy bays, and on the margins of the open brackish ponds throughout the islands. They do not remain long.

*Tringa minutilla*, American Stint.—Arrives about the same time, and frequents the same localities, as the preceding species.



I shot one as late as the 23rd December, probably a straggler left behind. I also obtained a solitary example on its northward flight on the 29th April, 1875.

*Tringa maculata*, Pectoral Sandpiper.—Not uncommon in September and October. The first I met with was feeding with a small flock of Semipalmated Sandpipers at Peniston's Pond, on August 3rd, 1874. It was tolerably abundant till towards the end of October, being usually found singly. Major Wedderburn says of this species (Nat. in B., p. 44), "On the 9th October, 1849, they appeared suddenly in thousands, particularly at St. George's, after a heavy gale of wind; the parade ground at that place was swarming with them, and I think Colonel Drummond killed some thirty or forty couple before breakfast; but, with the exception of a few stragglers, they were all gone by the following day."

*Tringa Bonapartei*, Schinz's Sandpiper.—This bird did not occur in the autumn of 1874, to my knowledge. It is recorded by Major Wedderburn, and is, I believe, sufficiently numerous at times, especially in the Great Sound and Castle Harbour.

*Tringa maritima*, Purple Sandpiper.—One was seen by Major Wedderburn at the entrance to St. George's Harbour.

*Calidris arenaria*, Sanderling.—Generally to be found in the autumn months, especially on the sandy beach below the sand-hills, where I obtained specimens in November, 1874. One of these I lost temporarily, and on recovering it the next day I found that not only the body, but the webs and *shafts* of the feathers, had been devoured by a swarm of voracious ants.

[*Limosa hudsonica*, Hudsonian Godwit.—A specimen of this bird in Mr. Bartram's collection was shot near the Causeway at St. George's in the autumn of 1875.—H. D.]

*Totanus semipalmatus*, Willet.—One was shot by Major Wedderburn on Pearl Island on July 3rd, 1848; doubtless a young bird driven by stress of weather from the breeding haunts of the species on the North American shores.

*Totanus melanoleucus*, Greater Yellowshank.—More or less common, arriving early in August, remaining for a month or so. Much in request among the energetic sportsmen who brave the heat and mosquitoes for the sake of a "bag" of "snippets." Its quadruple note, "thew-thew-thew-thew," is very loud and striking. Mr. Hurdis mentions one killed when on its northward migration, on the 5th June, 1852. Another was shot by

Lieut. Denison on the 27th April, 1875, and one seen at the same time, but not obtained.

*Totanus flavipes*, Yellowshank.—The most conspicuous and noisy of the August arrivals. It has been seen as early as the 13th July, but usually disappears towards the end of September. Considerable numbers fall victims to the gun, as they are not bad eating. If a wounded one falls into the water it is possible to shoot the whole of the flock, as they hover over their unfortunate companion. This murderous proceeding is alluded to, I think, by Wilson. The only instances of the occurrence of this species in the spring took place in 1875, when I saw one on the 26th, and obtained two at Peniston's Pond on the 29th April. These were, of course, in beautiful plumage.

*Totanus solitarius*, Solitary Sandpiper.—I observed one on the 19th July, 1874, but they generally come with the other species in August. They soon betake themselves to the wooded swamps, where they may be found singly or in pairs throughout the autumn. Fresh arrivals sometimes take place in the spring. Their habit of bobbing the head and body when alarmed is very comical. I always found them very tame, even when I was accompanied by a big Clumber spaniel, whose elephantine advances in no way disconcerted them.

*Tringoides macularius*, Spotted Sandpiper.—Flocks of young birds appear early in August, followed soon after by a limited number of adults. They frequent the same places as the other "snippets," and serve to swell the "bag" of the gunner in August and September. A few remain all the winter, and several examples have been observed in spring, presumably strangers on their way north. The "weet-weet" of this bird, as it skims over the water like our European Common Sandpiper, is very familiar to residents in the islands.

*Actiturus Bartramius*, Bartram's Sandpiper.—One in my collection was shot by Gibbs at Peniston's Pond on September 20th, 1874. It was a single bird, and was in company with a flock of small Sandpipers at the time. [I obtained another in a field near Peniston's Pond on the 18th September, 1875.—H. D.]

*Numenius hudsonicus*, Hudsonian Curlew.—Appears early in August, in limited numbers, and is so wary that very few are ever obtained.

*Numenius borealis*, Esquimaux Curlew.—Commoner, and easier

to approach than the preceding. Locally termed "Wood Snipe." A good number accompanied the Golden Plover on their arrival in September, 1874, and several were killed along the north shore. Both species of Curlew remain but a short time.

*Ibis falcinellus* (var. *Ordii*), Glossy Ibis.—An inhabitant of the Southern United States, separated from the European species by Bonaparte in 1838, but occupying still an uncertain position with regard to it. One example only has occurred in Bermuda, seen by Mr. Hurdis, but not obtained.

*Ardea herodias*, Great Blue Heron.—Of this fine species Major Wedderburn says (Nat. in B., p. 38), "Many of these birds arrive in autumn, and a few remain throughout the year. In 1846 the nest of this bird, containing two eggs, was found amongst the mangrove trees at Hungry Bay. The Rev. H. B. Tristram kept one of these Herons alive in his garden (at the Parsonage, in Ireland Island), which was once seen to seize a Ground Dove and swallow it entire." I made numerous enquiries, and kept a careful look-out, but was unable to ascertain whether any second instance occurred of the nest being found. Most of the examples obtained or seen during my stay were in immature plumage. A few were always to be seen singly, among the islands in the Great Sound and Castle Harbour, being very wary and hard to approach.

*Ardea egretta*, Great White Egret.—Two were killed at Hungry Bay in 1840; several were subsequently seen, but not obtained. A coloured youth described two of these birds to me as having been seen by him in Warwick Swamp in October, 1874, adding that he shot one, but it was too much knocked about to keep. These may have belonged to the next species, but, from the size mentioned, I fancy them to be referable here. Mr. Bartram has obtained one specimen. [One was shot in Devonshire Swamp by Capt. Hussey, of the 20th Regiment, and presented to me on the 6th October, 1875.—H. D.]

*Ardea candidissima*, Snowy Heron.—Two beautiful specimens, in full plumage, were shot by Major Wedderburn in April, 1850, and several were seen in September following. Thus it seems that it visits the islands both in spring and autumn at the usual periods of migration. Mr. Bartram has a pair in his collection.

*Ardea cærulea*, Little Blue Heron.—Mr. Hurdis says, "Of seven specimens of this Heron which came under my observation, four were shot in April and May, and three in September and October.

It may therefore be considered both a vernal and autumnal visitor to the Bermudas. Three of the spring specimens were beautiful exemplifications of the change from the white plumage of the young to the rich vinous purple of the adult bird." Several of these examples are alluded to by Major Wedderburn in his notes. I do not think the bird visits the islands regularly. I obtained a beautiful male from Hungry Bay on the 4th May, 1875. It was in company with a white bird, perhaps an immature specimen of the same species.

*Ardea virescens*, Green Heron.—Also occurs on both migrations, sometimes in considerable numbers in the spring, frequenting the dense mangroves, and being uncommonly hard to obtain. Lieut. Denison and I each shot two beautiful specimens in April, 1875.

*Nyctiardea grisea* (var. *nævia*), Night Heron; Qua-bird.—Immature birds are not uncommon in the larger mangrove swamps in the autumn and winter, but none have yet been obtained in adult plumage. One examined by Mr. Hurdis, shot on the 9th February, had the irides bright carmine, and the long filamentous plumes of the occiput beginning to appear. These birds sit motionless among the mangroves, and when disturbed fly into the tops of the thickest trees, whence they are very hard to dislodge.

*Nyctiardea violacea*, Yellow-crowned Night Heron.—Unlike its congener, this Heron has occurred in the plumage of the adult. Mr. Bartram has obtained several fine specimens. I obtained two myself, but both were in the spotted garb of youth. There is a great similarity between the young of these two species, but *violacea* may always be distinguished, in any plumage, by its longer tarsus and shorter bill. Occurs pretty regularly in small numbers, usually in autumn, but occasionally in spring. One of my specimens was shot as early as the 3rd August.

*Botaurus minor*, American Bittern.—A regular visitor in the autumn, and occasionally in March, frequenting the sedgy patches on the edges of the mangrove swamps. Mr. Hurdis says, "The stomach of one, shot in the Pembroke Marshes, contained an eel six inches long, a mouse, a dragonfly, a grasshopper, and part of a small golden carp." [No less than thirteen were shot by one officer, whose name I hesitate to mention, in the autumn of 1875.—H. D.]

*Ardetta exilis*, Least Bittern.—Has occurred both in spring and autumn, but, from its frequenting the thick mangrove swamps and hiding among their tangled roots, has not very often been obtained.



Major Wedderburn procured several specimens between 1847 and 1850. I shot a female near the Sluice-gates on March 1st, 1875. [One was obtained at Basden's Pond in December, 1875.—H. D.]

*Rallus virginianus*, Virginian Rail.—One was shot by Mr. Hurdis on the 6th November, 1851. He remarks, "This is the only genuine *Rail* met with—a singular circumstance, when we bear in mind that *all* the Gallinules and Crake-Gallinules known to the continent of North America have been obtained in the Bermudas."

*Porzana carolina*, Carolina Rail; Sora Rail.—Visits Bermuda regularly, arriving early in September (one has been shot on the 24th August), and remaining till November, a few lingering on through the winter. On their vernal migration they frequently appear in considerable numbers in March and April. I have seen them as late as the 1st May. An extraordinary large flight visited the islands in October, 1849, departing in a body after a three-weeks' stay. These birds are a great nuisance to the gunner in search of Snipe and other denizens of the marshes, as they bother a dog sadly both by their numbers and their skulking habits; and they themselves are not worth powder and shot, except immediately after their arrival.

*Porzana noveboracensis*, Yellow Rail.—Two obtained in Pembroke Marsh by Major Wedderburn in October, 1847.

*Porzana jamaicensis*, Black Rail.—Observed, and also obtained, by Major Wedderburn in 1847 and 1848, and by Mr. Hurdis in 1851, always in the autumn.

*Crex pratensis*, Corn Crake; Land Rail.—Major Wedderburn shot the only specimen of this European bird ever obtained in Bermuda, on the 25th October, 1847, and sent a notice of its occurrence to 'The Zoologist' in 1849. At that time it was probably not known that the species is a straggler to the United States, but latterly several instances of its appearance there have been recorded, so that the fact of its being killed in Bermuda has lost much of the mystery which was originally connected with it.

*Gallinula chloropus?* (var. *galeata*), Florida Gallinule; Moorhen.—Resident, tolerably abundant, breeding in the flags and sedges in the deepest and most inaccessible parts of the marshes. Also migratory, visitors appearing in October. Like the "Sora," this is a sad pest to the snipe-shooter when working the thick places, unless his dog be as steady as old Time. The Latin name

of this bird given above plainly shows that "doctors disagree" about its specific identity with our familiar Moorhen. So far as I can judge, the two are inseparable, but my Bermuda specimens seem a trifle larger than the European birds.

*Porphyrio martinica*, Purple Gallinule.—This bird must not be confounded with the European *P. hyacinthinus*, of which it is the American representative. Several were obtained in 1849 and 1850, in the month of April. Mr. Bartram has several specimens. I am almost sure I saw one in Devonshire Swamp in February, 1875. The shy habits and nature of the haunts of this species doubtless prevent many examples being recorded in the visiting list.

*Fulica americana*, American Coot.—Clearly distinct from our *F. atra*. A regular visitor in autumn, but never in great numbers. It also occurs on its northward journey, for Mr. Hurdis records one killed at Somerset on the 28th May, 1847, and I watched one close to me at Basden's Pond on the 27th April, 1875.

*Phænicopterus ruber*, American Flamingo.—One was seen in a mangrove swamp by Mr. Hurdis.

*Cygnus americanus*, Whistling Swan.—One shot in White's Marsh; the witnesses were living in 1859.

*Anser hyperboreus*, Snow Goose.—Major Wedderburn's notes contain the following:—"On the 19th October, 1848, Mr. Hodgson Smith shot two of these birds, in their young plumage, at Riddle's Bay; but unfortunately for the ends of science, they furnished the dinner-table instead of the cabinet." Mr. Hurdis adds, "A wing, pertaining to one of the specimens mentioned by Major Wedderburn, was fortunately saved by Mr. Smith, which removed all doubts as to the species it belonged to. In October, 1849, two 'white Geese' were observed in Mangrove Bay, and on the 10th March, 1851, four dark gray-coloured Geese were seen on the wing, near Peniston's Pond. These were doubtless *A. hyperboreus*." I may here remark that the young of the Blue Goose, *A. cærulescens*, much resembles that of *A. hyperboreus*, and that consequently the birds seen may possibly have belonged to the former species.

*Branta canadensis*, Canada Goose.—Included in the list given in 'The Naturalist in Bermuda,' but with no information appended. It has been occasionally seen, but rarely obtained, in the islands. It was observed on three occasions during my stay, one being seen on Peniston's Pond in the autumn of 1874, one in the Great Sound on the 10th January, 1875, by the officers of the 53rd Regiment,

as they were leaving the islands on their homeward journey, and a third near Daniel's Head by Lieuts. Denison and Hussey, R.E., early in February, 1875. A man of colour was seen by these two officers to fire at the last-named bird; but he stupidly let drive at it, with small shot too, at a hundred and twenty yards, instead of paddling much nearer to it, as he might have done. A wild Goose, weighing ten pounds when plucked, was shot in Southampton parish on the 7th January, 1875, and eaten forthwith by the fortunate gunner or his friends. This undoubtedly belonged to the present species, but cannot be definitely recorded.

*Anas boschas*, Mallard; Wild Duck.—A female was shot by an officer of the 56th Regiment at Warwick Pond on November 3rd, 1854. It was in company with some tame ducks, always taking wing the moment anyone approached the water (Nat. in B., p. 48). Four—a Mallard and three Ducks—were observed in the Great Sound by Lieut. Hussey, R.E., on the 23rd December, 1874.

*Anas obscura*, Dusky Duck; Black Duck.—Usually visits Bermuda in small numbers in the autumn, remaining till the end of January or even later. A flock of twenty frequented Harrington Sound and Peniston's Pond from Christmas, 1871, to February 15th, 1872 (J. M. Jones). Specimens were obtained by Lieut. Denison and myself in January, 1875, when there were a good many about. They are always very shy, and when disturbed frequently fly a long way out to sea.

*Dafila acuta*, Pintail.—Several specimens were obtained, all in immature plumage, in the winter of 1847-8. Mr. Bartram has a male in full plumage, shot by himself near St. George's. [A female Pintail was shot by Gibbs in Smith's Marsh on the 26th October, 1875.—H. D.]

*Chaulelasmus streperus*, Gadwall.—A female Gadwall was captured alive in December, 1849, and was in the possession of Mr. Hurdis till May, 1851, associating with some tame ducks and laying several nests of eggs, none of which, however, proved fertile (Nat. in B., p. 47).

*Mareca americana*, American Wigeon.—After a revolving gale in October, 1854, several of these birds were shot, and brought for examination to Mr. Hurdis, who obtained one himself in the following month (Nat. in B., p. 49). Two were shot at Devonshire Bay by Corporal Alder, R.E., in October, 1874.

*Querquedula carolinensis*, Green-winged Teal.—This is an

occasional visitor in autumn. One was shot at Peniston's Pond on October 10th, 1874, and a few days later I stalked another in vain at the same place. Capt. Rooke, 53rd Regiment, shot one in Devonshire Swamp in November, 1874. I am not aware of the occurrence of the European *Q. crecca*, or common Teal, in Bermuda. It occurs as a straggler in North America. [Four were shot by Lient. Tallents, of the 20th Regiment, in the autumn of 1875.—H. D.]

*Querquedula discors*, Blue-winged Teal.—A frequent visitor on its way south, but rarely seen on its northward journey; most numerous in October. Nine couple were killed in Pembroke Marsh after the gale of the 22nd October, 1854, and many more at St. David's Island, where a native sportsman is said to have killed sixteen couple during the gale (Hurdis). I obtained several specimens in October and November, 1874, and saw two, one of which I knocked down, but unfortunately lost, in the mangrove swamp near the Sluice-gates, on April 30th, 1875.

*Spatula clypeata*, Shoveller.—“A single female specimen was shot in December, 1844, by Mr. C. B. Fozard” (Nat. in B., p. 47).

*Aix sponsa*, Summer Duck; Wood Duck.—“A female bird of this species was shot by Dr. Cole, 20th Regiment, on the 16th December, 1846” (Nat. in B., p. 48).

*Fuligula affinis*, Lesser Scaup Duck.—To make matters clear, in treating of this species, I must call in the aid of Dr. Coues, who says, in his ‘Birds of the North-West’ (p. 574):—“Authors are at variance concerning the relationship of the bird to the preceding (*F. marila*), and the question is not yet settled. For myself I am rather inclined to keep the two apart, notwithstanding their very close resemblance, and admitting the probability that intermediate examples may be found. There appears to be something different in their range, the *F. affinis* being the more southerly. Not that it does not in the breeding season reach as high latitudes as the other, but that its autumnal movement is pushed to the West Indies and Central America, where the true *F. marila* is not recorded as occurring. It is improbable that two varieties, if they be really such, should preserve this difference.” Armed with this authority, I think I may safely refer the specimens of the Scaup chronicled in ‘The Naturalist in Bermuda,’ all of which measured only 16 to 16½ inches in length, to this smaller species, *F. affinis*. The length of *F. marila* varies from 19 to 20½ inches. The



specimens alluded to are one killed by Mr. C. Abbott, 20th Regiment, on the 19th December, 1846, and two others by Major Wedderburn, at Warwick Pond, on the 8th January, 1849. [On the 25th February, 1876, I shot a female of this species at Tucker's Town, which measured sixteen inches in length.]

*Fuligula collaris*, Ring-necked Duck.—One was captured, and kept for a short time alive, by Mr. Hurdis, on the 13th November, 1850. He was anxious to watch the change of the plumage, but the poor bird fell a victim to a cat (Nat. in B., p. 50).

*Fuligula vallisneria*, Canvas-back.—Mr. Hurdis purchased a specimen of this Duck from some boys, by whom it was captured alive in a marsh near James's Cottages, on the 30th October, 1851. It was destroyed by ants soon afterwards. On the 23rd November following he observed a very fine specimen in White's Marsh.

*Bucephala clangula*, Goldeneye.—“A male specimen was shot on the 10th April, 1854, in Pembroke Marshes” (Nat. in B., p. 49). There were several of these Ducks about the islands in the winter of 1874-5, and I succeeded in obtaining two, both males, in immature plumage, at Peniston's Pond, on the 29th December, 1874, and 5th February following. A flock of seven frequented Shelly Bay Marsh, and were also seen by Lieut. Hussey in the Great Sound; but I am not sure that any other specimens were procured. I at first thought my birds were *B. islandica* (Barrow's Goldeneye), but if Dr. Coues be right in his opinion as to this latter species “having apparently a circum-polar distribution, and penetrating but a limited distance south in winter,” I presume they are referable to true *clangula*. But are the two really distinct? [A female duck of this species was shot by Bendall in Devonshire Swamp on the 22nd January, 1876.—H. D.]

*Bucephala albeola*, Buffel-headed Duck.—One was obtained in Pembroke Marsh in December, 1845, and others have been occasionally observed subsequently. [Lieut. Tallents, of the 20th Regiment, shot a male bird of this species at Peniston's Pond in November, 1875.—H. D.]

*Ædemia perspicillata*, Surf Scoter.—Two recorded in ‘The Naturalist in Bermuda’—one killed with a stick in Hamilton Harbour on the 8th January, 1849, and another shot in Pembroke Marsh on the 7th October, 1854. Lieut. Hussey, R.E., shot one (a female) on a small pond near the lighthouse, on the 17th November, 1874, and kindly presented it to me.

*Erismatura rubida*, Ruddy Duck.—A young male of this species was shot by Dr. Cole, in a marsh near Hamilton, on the 24th November, 1846.

*Mergus merganser*, Goosander.—Included in Major Wedderburn's list as having been seen, but not obtained.

*Mergus serrator*, Red-breasted Merganser.—Mr. Bartram has an undoubted specimen, obtained by him near St. George's.

*Mergus cucullatus*, Hooded Merganser.—A female was caught near Ireland Island by one of the crew of H.M.S. 'Scourge,' on the 10th January, 1849, and one was shot near St. George's on the 23rd December, 1850. A third example was obtained by Mr. Bartram, and is now in his collection.

*Sula fiber*, Booby Gannet.—Major Wedderburn records the occurrence of one of these birds, which flew into one of the barrack-rooms at Fort Catherine on October 3rd, 1847. Another, in Mr. Bartram's collection, was shot by an officer with a revolver, curiously enough, very near the same fort. [A young bird in my collection was caught on the rocks near Fort Cunningham on the 26th September, 1875, and lived a short time in confinement.—H. D.]

*Pelecanus fuscus*, Brown Pelican.—Two examples are recorded by Major Wedderburn, who says (Nat. in B., p. 51), "One of these birds was shot at Hungry Bay, many years ago; and another was killed near St. George's in April, 1850, which was given to me by Colonel Drummond."

*Graculus dilophus*, Double-crested Cormorant.—Three instances of the occurrence of this species are recorded in 'The Naturalist in Bermuda,' viz., one shot by Capt. Orde, at Pitt's Bay, on the 10th October, 1847; one by Major Wedderburn, on Grace's Island, on the 8th February, 1848; and another, mentioned by Mr. Hurdis, which frequented the islands for some little time, but was not obtained. There is a specimen in Mr. Bartram's collection, and another in that of Mr. Lane, of Hamilton. There were several of these birds about the islands in the winter of 1874-5, but they were so wary that none were obtained. One was repeatedly seen, and once fired at, in the Great Sound; one attached itself to St. George's Harbour; and a pair frequented the "Stag" Rocks, near Shelly Bay, all the winter, conspicuous to the passers-by as they sat in solemn security on their accustomed pinnacle. I tried in vain to obtain one of these, but never got a shot. One of them

flew close over my head one morning, but I had not my gun in my hand at the moment. [One was shot at Basden's Pond, by Lieut. Tallents, of the 20th Regiment, in the autumn of 1875.—H. D.]

*Tachypetes aquilus*, Frigate Bird; Man-of-War Bird.—Two were obtained at Ireland Island, on the 27th and 30th September, 1848, respectively, by Major Wedderburn. One was shot by Capt. Clutterbuck, of the 56th Regiment, on September 30th, 1852, and another by Capt. Tolcher, of the same Regiment, on April 2nd, 1854. Mr. Bartram has two specimens in his collection, obtained by himself.

*Phaëton flavirostris*, Tropic-bird.—The geographical distribution of the three known species of Tropic-bird, *P. æthereus*, *P. flavirostris*, and *P. rubricauda*, seems not yet well defined, and no doubt their extensive wanderings will render any attempt at precise limitation extremely difficult, certainly until we are in possession of a larger series of observations than at present. *P. flavirostris* (the "Boatswain-bird" or "Long-tail" of the Bermudas) is a familiar and abundant summer visitor to the islands, arriving at the end of February or beginning of March, and departing early in October. It is also recorded on the southern shores of Cuba, but I cannot make out any other regular locality for it. Where it goes to in winter is not, I believe, satisfactorily determined, though it may be taken for granted that the movement is in a southerly direction from Bermuda and Cuba. An occasional straggler is said to have been seen in Bermudian waters in winter time, presumably an early arrival, or backward young bird left behind. One was shot as far north as the coast of Nova Scotia, after a violent gale from the south, on the 4th September, 1870. I saw this bird in the Halifax Museum. The excellent accounts of the habits and nidification of this species given by Mr. Hurdis and Major Wedderburn have left me but little to say. The single egg, which in colouring is not unlike that of our Kestrel, is deposited in holes in the rocks, always in those which have a flooring of sand, preference being given to steep and overhanging cliffs on the south shore and the islands about Castle Harbour. A few pairs nest on the northern shore, where the cliffs are much lower. Sometimes one can see the sitting bird's long tail-feathers protruding from the nest; while in another case the nest may be so far in, horizontally, that one can only tell there is one by the harsh grating cry of the disturbed occupant. Both male and female sit, fighting

vigorously with their formidable bills in defence of their home. The young also show fight; in fact, the species is peculiarly fierce and untameable. Three young ones I kept alive for about two months maintained their savage nature till the last, refusing to feed themselves, striking viciously at anyone who approached them, and even at one another. Their flight is peculiar, but graceful, and they never seem tired of their perpetual wheeling and manouvring. They take beautiful headers, like a Tern or Gannet, in pursuit of small fish. It is rare to meet with a specimen possessing two good long central tail-feathers; one is generally smaller and shorter than the other. Some of these feathers are of a lovely orange-pink. They get rubbed off during incubation, and may be picked up near the breeding-places. Two broods are reared, fresh eggs being found as early as the 10th April, and again at the end of June: there are intermediate examples, probably laid by birds whose first nests have been visited by the spoiler. That these birds revisit their breeding-stations year after year is, I think, clearly shown by the following circumstance:—Mr. Bartram, by way of experiment, slit the two webs of one foot, and cut off one or two claws, of a young bird in a nest near his house. Next year this bird turned up again, and made its nest close to the same spot. This attachment to the family residence is, I fancy, far from unusual with migratory birds. Swallows and other familiar visitors to England are known to possess it in a marked degree. On a calm day the bright greenish blue tint of the Atlantic waters, as they gently rise and fall above the white sands below, is reflected on the glossy white breasts and under parts of the Tropic-birds in a most remarkable manner as they cruise about, at no great height, along the shores or among the islands. During the breeding season the parent birds “off duty” are to be seen in the neighbourhood of their nesting-places all the morning till about noon, when the greater part disappear in a rather mysterious manner. I came to the conclusion that they proceed to a considerable distance out to sea, returning at dusk, and this opinion was much strengthened by seeing two old birds sitting on the water one afternoon, at least one hundred miles from the Bermuda shores. This was during a voyage from Bermuda to New York, on the 7th August, 1874, when the second “young hopeful” had probably left, or was about to leave, the nest, and therefore does not prove much; but it shows that these strong-winged birds, who would



probably do their one hundred miles in three hours, or even less, *do* travel to such distances from land long before they have thought of quitting their breeding haunts. In Castle Harbour, where there are a great number of Tropic-birds continually on the wing, and where they are left comparatively undisturbed during the day-time, this disappearance is, or appears to be, on a somewhat smaller scale.

*Larus marinus*, Great Black-backed Gull.—Mr. Hurdis mentions an immature example of this Gull, which was captured alive in the Great Sound in December, 1851, and Mr. Bartram has a fine specimen, also in immature plumage, shot by himself near Stocks Point on the 27th December, 1862.

*Larus argentatus*, Herring Gull —Without venturing to discuss the relative merits and demerits of the varieties, or sub-species, *occidentalis* of Audubon, and *Smithsonianus* of Dr. Coues, I shall assume that all the examples that have occurred in Bermuda may be assigned to the true *argentatus*. These Gulls occur frequently, not regularly, and many specimens have been obtained. One in my collection was shot in Devonshire Bay on the 4th November, and they have been seen as late as the 19th March. [This Gull was numerous in the autumn of 1875. I obtained several specimens, all immature, the bill in most cases measuring one inch and three-quarters in length. These are probably referable to the variety *occidentalis*.—H. D.]

*Larus delawarensis* (*L. zonorhynchus* of Audubon), Ring-billed Gull.—Only one on record, killed by Major Wedderburn near the Dockyard on the 1st January, 1849, during a north-westerly gale.

*Larus tridactylus*, Kittiwake.—Not uncommon, but irregular in its visits, which occur from January to March. Most of the examples obtained are in immature plumage.

*Larus atricilla*, Laughing Gull.—One seen, flying close past him, by Major Wedderburn, at Ireland Island. Mr. Hurdis records that one was taken alive by a fisherman in the winter of 1851-52, and was confined for some time in a spare room, eventually effecting its escape.

*Larus philadelphia*, Bonaparte's Gull.—Three are recorded by Major Wedderburn. One was shot by himself on the 27th January, 1849; a second was seen by him on the 15th December, 1849; and another was killed on the 24th February, 1850. [Two in

Mr. Bartram's possession were shot in St. George's Harbour in January, 1876.—H. D.]

*Xema Sabinei*, Sabine's Gull.—Major Wedderburn says, "A single specimen was shot by Colonel Drummond, near St. George's, but the date I do not recollect."

*Sterna anglica*, Gull-billed Tern.—One only has occurred, taken alive in the R.E. workshops at Boaz Island, on the 29th April, 1875. This bird, which proved to be a female, lived only a short time. It is now in Lieut. Denison's collection.

*Sterna hirundo*, Common Tern; *Sterna paradisæa*, Roseate Tern.—These two Terns used to visit Bermuda annually, breeding there in considerable numbers on the rocks and small islands in Castle Harbour; but I hear they have now left the place, never to return. Doubtless the increase in the population of the island and the continual plundering of their nests have driven them away. They were sufficiently numerous in 1850; but I cannot ascertain the date of their last appearance. Not a single one was to be seen in 1874 or 1875.

*Sterna fuliginosa*, Sooty Tern.—Of rare occurrence. Major Wedderburn says, "Dr. Cole shot a specimen of this Tern in October, 1846. During the whole time I was quartered in Bermuda I only saw one of these birds, and that in the year 1848. I was walking on the sand-hills, and saw a bird apparently dead on the ground. I put down my gun, and picked the bird up, and was just putting him carefully in paper, when my prize thought fit to come to life and flew away, taking me so much by surprise that I never thought of using my gun. It was a most beautiful specimen, and must have been driven on shore by some heavy gale." Mr. Hurdis records that a third example was found in an exhausted state in Devonshire parish, on the 23rd October, 1854, after a severe gale the previous day. [A young male of this species, in curious plumage, was caught near Paget Quarry, and brought to me on the 19th September, 1875.—H. D.]

*Anous stolidus*, Noddy Tern.—A solitary example was killed near Ireland Island by Capt. Tolcher, 56th Regiment, on the 12th September, 1854.

*Oceanites oceanica*, Wilson's Petrel.—Major Wedderburn says, "I have often seen these birds flying about near the North Rock, and once or twice inside the outer reefs in stormy weather, but never succeeded in shooting any of them." One was shot by

Mr. Harford, 56th Regiment, some distance from the shore, on the 30th June, 1853. Mr. Bartram's collection contains a specimen. I am not aware that this species has ever been found breeding in Bermuda. I searched in vain for nests, but should not be surprised to hear of them being discovered there some day or other.

*Puffinus major*, Wandering Shearwater.—Two recorded by Mr. Hurdis were taken alive on the 2nd June, 1851, near Hamilton. Mr. Bartram has one example in the dark plumage, which, though probably only a special state of *P. major*, has led to the creation of the species *P. fuliginosus*, or Sooty Shearwater.

*Puffinus anglorum*, Manx Shearwater.—A specimen in Mr. Bartram's collection, captured while sitting on its solitary egg in a rocky hole on the south shore some years ago, is, I think, clearly referable here. The egg was unfortunately broken. There is no record of the bird's breeding on any other occasion, nor of any other specimens being obtained; but it is quite possible that it, as well as Wilson's Petrel and other *Procellariidæ*, may formerly have frequented the islands in numbers, and that an occasional pair may revisit their old haunts. Such birds would, from their crepuscular habits, be but little noticed.

*Puffinus obscurus*, Dusky Shearwater.—Since Mr. Hurdis, in 1849, identified the "Cahow" or "Cowhow" of the historians of Bermuda with this interesting species, very few observations have been made on the few pairs still frequenting the islands. That the poor "Cahow" has almost ceased to breed there is a melancholy fact. Formerly it was plentiful, and even within the last fifteen years, Mr. Bartram informs me, there were many nests in the isolated rocks, both on the north and south shores. On the north side the bird was formerly called "Pemblyco" or "Pimlico," probably from its call-note, while on the southern shores the name "Cahow" or "Cowhow" was applied to it. I found two nests in 1874, each containing a single young bird, one of which I kept alive for about six weeks, intending to send him to the Zoological Society's Gardens in London; but before I got an opportunity of doing so the unfortunate bird died. He had become remarkably tame, following me about the house and garden, waddling along awkwardly enough on his tarsi, and uttering a musical "chirrup" the while. He used to sit under the table where I was writing, pecking away at my boots, and apparently extremely happy. I fed him on fish, and gave him

a salt-water tub occasionally, which he thoroughly enjoyed. He slept a great deal during the day, and usually got behind an open door—the darkest place he could find—for his “siesta.” When I took him from the nest he was nearly able to fly, but still retained the long nestling-down of the young bird, slate-coloured on the head and shoulders, light brown on the under parts; the former soon rubbed off, but the latter was more permanent, and was not got rid of for some days. The nests were simple holes in the face of the rock—my bird had barely room to turn round in his. There was no unpleasant smell about the nests or young birds, the peculiar—and to me not disagreeable—odour of the Shearwater tribe being alone distinguishable by its presence. I saw nothing of the old birds, who were in all probability far out at sea at the time. An egg of this species, kindly presented to me by Mr. Bartram, is, of course, pure white: it has a considerable polish, and is about the size of a bantam’s, but less elongated in form. Mr. Bartram was good enough also to present me with two skins of the adult bird. He tells me that the statement made by the old historians of Bermuda as to the capture of the “Cahow” at night is no exaggeration; for, on visiting an island one night where there were several pairs breeding, he quickly caught half-a-dozen of them, the stupid things settling on his body as he lay on the ground, and allowing themselves to be taken in his hand! I know of only one instance of a “Cahow” being seen on the wing in the daytime in Bermudian waters: this was in August, 1874, when one was shot crossing Castle Harbour, by Lieut. Hopegood, 97th Regiment.

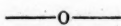
*Podiceps cornutus*, Horned Grebe.—One shot by Dr. Cole, on the 24th November, 1846, is now in the Rev. H. B. Tristram’s collection. One was killed by Capt. Tolcher, 56th Regiment, near Spanish Point, on the 1st February, 1855: it was in company with three or four others. Mr. Bartram has two specimens of different dates.

*Podilymbus podiceps*, Pied-billed Grebe; Water Witch.—Three are recorded in ‘The Naturalist in Bermuda’—two obtained in October, 1849, and one by Major Wedderburn, in February, 1850. Mr. Hurdis once found a perfect skeleton of this bird by the side of a pond. Tolerably abundant in the winter of 1874-5, especially at Trott’s and Basden’s Ponds. The way in which these birds can *sink* under water, without leaving a ripple behind, is truly



marvellous, and entitles them fully to the name "Water Witch." They are very shy, but I once surprised one asleep on a flat stone, as much to my astonishment as to the bird's. All the specimens I saw were in immature plumage, wanting the black bar on the bill and the black throat-patch.

*Mergulus alle*, Little Auk; Sea Dove.—Mr. Hurdis says, "One of these birds was captured alive on the 28th January, 1850, by a servant of the Rev. J. U. Campbell at Ireland Island. It was in company with four or five others on a piece of grass-land near that gentleman's house. Unfortunately this specimen was destroyed by a pig before I had an opportunity of seeing it. My information was obtained from Mr. Campbell himself, who had this bird in his possession."



#### ORNITHOLOGICAL NOTES FROM DEVON AND CORNWALL.

BY JOHN GATCOMBE.

VISITING Wembury again on June 12th I found the young Gulls much grown, and observed many of the old ones searching for food in a ploughed field adjoining the cliffs. Among the various marine animals with which the young Gulls are fed, I think small cuttlefish must form a portion, as I have remarked the so-called back bones, or internal shells, of those creatures lying near the nests. The Peregrines I am sorry to say appear to have entirely left the locality. On the 13th Cuckoos were very plentiful on the borders of Dartmoor, and I noticed a young one, perched on an old wall, being fed by a Pied Wagtail. A Turtle Dove has just been brought to a Stonehouse bird-stuffer; and I mention this as the species is rarely met with in the neighbourhood of Plymouth. Some years ago the Collared Turtle, *Turtur risorius*, was occasionally killed by our gamekeepers, apparently in a wild state, and sent to be preserved for the British species; indeed, it was said to breed in some of our large woods and plantations; but I have neither seen nor heard of the capture of a specimen since. Some of our bird-stuffers, too, believed that these birds were natives, and seemed astonished on being told the contrary. But of course all the specimens must, in the first place, have escaped from confinement.

When visiting the banks of the River Lyd, on June 18th, I was pleased to see several young Water Ouzels making short flights

from rock to rock by the side of the stream: they were in the nestling plumage, their white under parts showing a yellowish tint closely marked with faint semicircular lines. Young Green Woodpeckers were also numerous in the adjoining woods; and a beautiful young male, fully fledged, was caught by a friend of mine when fishing, as it was struggling in the river, having, I suppose, fallen from some tree or bush, or perhaps failed in an attempt to fly across the stream. Both the Great and Lesser Spotted Woodpeckers have bred in the woods by the side of the Tamar this season. Swifts were exceedingly plentiful, and I observed some feeding their young in the holes of an old pillar or high stone wall, intended for a kind of railway viaduct. Sand Martins, too, again occupied holes in the banks of the Tamar, the only breeding locality for them that I am aware of anywhere within many miles of Plymouth. Strange to say about a dozen Swifts were lately captured by taking the artificial flies of fishermen on the River Dart, an incident which has been immortalised by Bewick in one of his vignettes. A fine Shag which I examined was in perfect breeding plumage, with the exception of the curved crest, which is usually lost by the middle of June; but I have seen old birds with a fine, glossy, greenish black and bronzed plumage in the middle of winter.

In my last notes I mentioned having visited a small heronry near St. Germain's. I have since been informed by a clergyman living in the locality, that with the aid of a long ladder he once endeavoured to look into one of the nests, but the instant his face appeared on a level with the edge a young bird made a sudden and vicious thrust straight at his eye, in evading which he nearly fell headlong from the tree.

On July 4th Blackcaps and Garden Warblers were still singing in the woods by the side of the Tamar, whilst large families of Blue and Cole Tits were already flitting from tree to tree, swinging and hanging from the branches in every conceivable posture, the parents assiduously attending to the wants of their young.

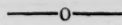
The young Gulls at Wembury were by this time for the most part fledged, though some were still in the down. A large colony of Martins were nesting on the face of the cliffs, and it was very curious to see them when flying past make a dash at the small feathers or particles of down which came from the Gulls, as if they were insects. A Herring Gull has for many years been in the

habit of visiting a certain garden or lawn at Ivybridge every morning at a particular hour, when it is regularly fed from the house; after which it invariably takes its departure, and is not seen again until the next day; but in the breeding season it sometimes remains away for weeks together, and has once or twice returned with a companion or mate. I have had an invitation to call in order to see this bird: I hope to learn more of its history.

In August numbers of young Herons were to be seen on the mud-banks of our rivers and estuaries, and a few at the trout streams. Young Gulls, too, were very numerous in our harbours; but I am sorry to add scores were wantonly shot. Many Gannets, also, were to be seen off the Cornish coast, some in adult plumage, others with the head, neck and lower parts white, but the wings very dark. There was lately an account given in one of the local papers of a Gannet having been choked in its attempt to swallow a garfish. Ravens are still rather plentiful on some parts of the coast; and a short time since three fine young birds, apparently as large as their parents, were killed at one shot when flying off the cliffs, and sent to Plymouth to be preserved. A pair of Peregrines nested in the same locality, but were killed by a farmer; and their young, which were taken, are now in captivity.

In 'The Zoologist' for August last (p. 343), there were notes on the occurrence of the White Spoonbill in Suffolk, and near Ely. I may here mention that on May 31st I examined two Spoonbills, which had been sent to a local bird-stuffer from Cornwall, where they had been shot a few days before. Their plumage was white, with the exception of the tips of the primaries and some of their shafts being either dusky or brown; none black, and there was no appearance of either crest or buff feathers on the breast.

I have just seen two Snow Buntings, which were brought home by a sailor from the late Arctic Expedition, and kept alive until within the last week, when they both died in moult.



#### OCCASIONAL NOTES.

NOTES FROM ALDEBURGH, SUFFOLK.—This has been a good autumn for waders, for there has been no lack of water in the meres. On the 14th August I had a Greenshank and a Wood Sandpiper brought to me. I have noticed several of the latter about and heard their well-known note, and

I believe the month of August never passes without some visiting their favourite haunts in the first mere. Several Black-tailed Godwits have been seen and four killed, two of which, both immature birds, were brought to me, one on the 24th August and the other on the 1st September. I had a good opportunity of watching a small party of four in the first mere early one morning. I have never met with these birds before, and have only seen one specimen in the flesh, which I recorded in 'The Zoologist' for 1871. On the 6th September I killed an adult Red-necked Grebe in the River Iken, and on the evening of the same day I had a young Shoveller Duck, two Turnstones, and a curious light-coloured variety of the Sand Martin brought in by one of the gunners. A Temminck's Stint and two beautiful Sanderlings were killed at Thorpe on the 8th September, all of which I obtained. I met with a flock of Curlew Sandpipers in the North Mere on the 10th, and shot two, both young birds. On the 26th I received an immature male Ruff, a Little Stint, and a Temminck's Stint from Aldeburgh.—JULIAN G. TUCK (Tostock House, near Bury St. Edmunds).

WADERS NEAR ALDERSHOT.—The large piece of water known as "Fleet Pond," near Aldershot Camp, through which the South-Western Railway runs, between Farnborough and Fleet Stations, has recently been almost emptied for the purpose of destroying the weeds. These had grown to such an extent that the fishing was virtually at an end. The pen-stock was opened on the 17th August, and has been closed about three weeks or so. As we have had little or no rain up to the present date (12th October) there is still very little water in the pond, and a large expanse of mud and sand continues to offer unusual attractions to various Waders and Ducks. Besides Curlews, Green Sandpipers, Dunlins, Gulls, a stray Tern or two, Snipe, and a considerable accession of Ducks, Herons and Lapwings, we have had several more noteworthy visitors. On the 23rd August I observed three Greenshanks and shot one for identification; on the 27th September there were two Ruffs, of which I shot one (this is, I think, somewhat late for this species to remain with us); and on the 6th inst. I obtained a Gray Plover, which had been badly wounded by an officer there. I previously saw two of them together, both on the ground and on the wing, but could not be sure of their identity: this is a rare bird so far inland. The Herons, of which as many as twenty sometimes assemble in the shallow water, are doing considerable damage to the fish, and are having a rare time of it. So also are the Carrion Crows,—which feed greedily on the large freshwater mussels left exposed by the receding waters,—the Snipe, and the Ducks. Of the latter family I have only seen one stranger, which I think was a Tufted Duck; most of them are common Wild Ducks from Dogmersfield Park and Hawley Pond.—SAVILE G. REID.

YOUNG THRUSH FEEDING A CUCKOO.—About two years ago, when staying at Bassenthwaite, near Keswick, where I had gone for a couple



of months in search of those rare and interesting fossils of the Skiddaw Slate, the son of the person with whom I was staying informed me that two days previously he had discovered a Cuckoo, just hatched, in a Meadow Pipit's nest along with three young pipits. As I was very desirous to procure a Cuckoo, in order to observe its habits, I had it taken from the nest, when about eight days old, and placed in a large cage, where I also put a nest of Blackbirds of the same age. The latter in a few days got too quickly advanced, in proportion to the Cuckoo, for my purpose, and I therefore replaced them with a brood of Thrushes about a week younger. These in a day or two I reduced to two in number, finding that the parent, as I wished, had discovered them. I then left but one, and about ten days later I was surprised at seeing it pick up a piece of hard-boiled egg and feed the Cuckoo with it as it sat upon a perch, on which it had to hop for the purpose. The feeding was observed by others besides myself and continued for some days until the Thrush unfortunately escaped, and about a week afterwards the Cuckoo died. Was this action on the part of the young Thrush prompted by natural instinct, or was it mere imitation of its parent? I am inclined to believe the latter.—W. KINSEY DOVER (Castle Connor, Ballina, Co. Mayo).

SCARCITY OF THE CORN CRAKE.—It may interest the Rev. Murray A. Mathew to hear that I found the Corn Crake very plentiful in the island of Tiree, on the west coast of Scotland, while on a short visit there in May last. Their "crake, crake" was to be heard in every direction on this island, fourteen miles by three in extent. The keeper told me they had been very numerous last year. I also heard them several times in the neighbourhood of Greenock at the end of the month. My brother, while shooting near Penrith, Cumberland, came across a good many. Perhaps the bird is changing its habitat and gradually moving northward. It would be interesting to hear whether this has been noticed by others in the "North Country." I can quite corroborate Mr. H. T. Wharton as to the disappearance of the bird from the north-west district of Middlesex. It used to be very common in the grass-fields about Hampstead and Hendon, but the last time I heard it was on the 19th April, 1875.—HARRY R. LEACH (Oak Hill Park, Hampstead).

BAILLON'S CRAKE NEAR PENZANCE.—On the 12th October Mr. Vingoe showed me a bird of the year of this species, which was shot on some marshy ground near the Marazion Station of the West Cornwall Railway, very near the spot where some years since the Yellowshank Sandpiper was shot. This is the third example of this small Gallinule that has been obtained in this neighbourhood. I may add it was shot by the eldest son of the Rev. D. Harrison, the Rector of the parish adjoining. In the two first specimens the adult character of the birds is shown by the pervading tint of ash-blue on the chin, breast and belly. In the present specimen

there is nothing of this colour, but a general tone of ashy brown with striated lines of brown. One of the first two specimens referred to was brought alive to Mr. Vingoe, and he had a good opportunity of observing the colour of the iris, which was a bright vermilion. This, I believe, is the colour in the adult bird. In the specimen I examined yesterday the colour of the iris was bright yellow. The weight of this little bird was just over one ounce, and the length, with extended neck, to the end of the tail-feathers, exactly seven inches and a half.—EDWARD HEARLE RODD (Penzance).

SKUA AND SHEARWATER AT CHRISTCHURCH AND POOLE HARBOUR.—When at Bournemouth in August I saw, in the shop of Mr. Hart, the birdstuffer, a good specimen of the Common Skua, which he informed me had been obtained on the 6th January, 1876. A boy had observed it in a ploughed field at Christchurch, and knocked it down with a stick. It is an adult bird and in good plumage. Mr. Hart also showed me a specimen of the Greater, or Cinereous, Shearwater, which had been captured by some fishermen in Poole Harbour on the 7th June last, apparently a female bird, and also in good plumage.—MARCUS S. C. RICKARDS (37, Cornwallis Crescent, Clifton).

EARLY ARRIVAL OF WILD GEESE.—Brent Geese and White-fronted Geese appeared on the North Devon coast as early as the beginning of October. In the first week of that month four White-fronted Geese, all splendid birds, were shot out of a flock on Braunton Marsh.—MURRAY A. MATHEW (Bishop's Lydeard).

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## PROCEEDINGS OF SCIENTIFIC SOCIETIES.

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### ENTOMOLOGICAL SOCIETY OF LONDON.

October 3, 1877.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Donations to the Library were announced, and thanks voted to the donors.

Mr. W. L. Distant exhibited a specimen of the ravages of *Dermestes vulpinus* (Fab.) in a cargo of dried hides from China. On the arrival of the hides in this country they were found to be infested and gnawed into holes by swarms of the insect in their different stages, causing a damage of from fifteen to twenty per cent. on the value of the cargo. It is not unusual to see this well-known insect amongst these articles, but quite unprecedented to find it in such numbers and causing such an amount of damage. In fact, its appearance had quite paralyzed the importation of the hides, and gave further proof of the value of Economic Entomology in the arts and manufactures.

Mr. M'Lachlan exhibited a portion of a wooden case containing hides from Shanghai, which was riddled with borings of the larvæ of this beetle.

Prof. Westwood remarked that some years ago the attention of the Society was drawn to the depredations of this beetle in a cargo of cork.

Prof. Westwood exhibited drawings of the pupa of a trichopterous insect (*Anabolia nervosa*), which swam about in water like a *Notonecta*, but used its middle legs as swimming apparatus. Prof. Westwood also made remarks upon the structure and situation of the mouth organs of the pupæ of Trichoptera, and stated that the mandibles of the pupæ were unlike those of the larva, while these organs were quite aborted in the imago. The Professor suggested that the mandibles of the pupa were for the purpose of enabling the insect to eat its way out of the case in which it had undergone its transformation, and in which, after cementing down the mouth, it was obliged to turn itself completely round, so as to escape at the opposite free extremity.

Mr. M'Lachlan confirmed this view of the function of the mandibles of the pupæ.

The President next exhibited a small lepidopterous insect from Lake Nyassa, apparently a species of *Psyche*, which had been sent in a paper packet with a pupa-case of a *Tachina*, from which it was stated that the moth had been produced. Prof. Westwood was inclined to believe that the larva of the moth might have simply made use of the empty pupa-case to undergo its transformation in.

Prof. Westwood read a post-card from Mr. Albert Müller announcing the formation of an entomological station at Basle.

The President then referred to the lepidopterous larva attached to a specimen of the homopterous *Eurybrachys spinosa*, which had been handed over to him by Mr. Wood-Mason at the last meeting, and exhibited drawings of both insects, the former being evidently identical with the species formerly described as being parasitic upon *Fulgora candelaria* (Trans. Ent. Soc. 1876, p. 519). In the absence of direct observation, the President was inclined to believe that the relation of the lepidopterous larva to the Homopteron was one of true parasitism, the former insect feeding on the waxy secretion of the latter, it being well known that certain lepidopterous larvæ of the genus *Galleria* feed upon wax.

Mr. Wood-Mason stated that the interesting specimen which he had handed to Prof. Westwood at the last meeting consisted of a lepidopterous larva clinging by its anal pair of prolegs to the free extremity of a stout, tough, flaccid cord, which was firmly fastened to the dorsal surface of the abdomen of the Homopteron. The specimens were captured in August or September, 1876, at Bangalore, South India, by Mr. G. Nevill. The caterpillar was closely allied to *Epipyrops* (West.). The cord to which it was clinging, Mr. Mason considered to be the wet and matted remains of a



case or sac, from the imperfectly closed aboral or free end of which the caterpillar had suddenly withdrawn itself (the case-bearers, as well known, readily being able to turn in their cases) on immersion in alcohol, and on which its anal pair of prolegs had closed in their death-grasp. The end of the cord fastened firmly to the back of the Homopteron being the oral or attached end of that case; *i. e.*, the end by which the case-bearers fasten themselves when at rest to the twigs and branches of the plants on which they live, the attachment being quite as firm, or even firmer, than that of the present specimens. Mr. Wood-Mason's view of the nature of the relation of the caterpillar to the Homopteron in all these cases had always been that the former is the messmate of the latter rather than its parasite, merely making use of it as a vehicle whereon to reach its vegetable food, just as in the curious case recently brought to notice by Fritz Müller ('Nature,' vol. xv., p. 264), and employing—as Colonel Godwin-Austen's valuable note on the specimen found by him on *Aphæna*, sp., and his own examination of that specimen in its cocoon seemed conclusively to prove—some of its messmate's wax to cover its body (and in some instances for the construction of a case), in order probably to render itself less conspicuous to its enemies (*Ichneumonidæ*, *Tachinidæ*, &c.) than it would be as a naked, fleshy, yellowish grub upon the white wax-covered surface of its messmate's body. He had opened the flattened squarish cocoon constructed by Col. Austen's specimen, and found the body of the enclosed caterpillar still clothed thickly on its upper surface with the satiny asbestos-like waxy substance secreted by its messmate. This specimen was probably identical with Professor Westwood's *Epipyrops*, while the one from Bangalore represented a different but closely-allied form, distinguished in the larval condition by the presence of a well-developed case, which may or may not have been rendered less conspicuous by a covering of wax borrowed from its homopterous "chum."

With reference to the firmness of the attachment of the cord to the back of the Homopteron, Mr. Jenner Weir reminded the Society that the larvæ of *Psyche* were always most firmly fixed, and Mr. M'Lachlan stated that the larvæ of *Phryganea* glued down their cases with great firmness under water.

Mr. W. L. Distant raised the question as to whether the Homopteron frequented the plants on which the caterpillar fed or whether the latter was omnivorous.

Prof. Westwood also mentioned a small dingy moth from Brazil, of which numbers had been found upon the Three-fingered Sloth, *Bradypus tridactylus*.

Mr. Meldola exhibited a collection of Lepidoptera, from Ceylon and the Nicobar Islands, formed by him in 1875. Among them were a few species new to science. The collection had recently been worked out by Mr. F. Moore.



Mr. H. Goss exhibited a series of specimens of *Lycæna (Cupido) Arion*, taken in the Cotswolds in June, 1877. One-third of the specimens exhibited were far below the average size, the remainder being of the normal size. Both forms were taken flying together at the same time of the year and in the same locality. Mr. Goss stated that according to his experience these dwarf specimens did not occur in the same proportion in other parts of the country where the species was taken. The specimens he had obtained in Devonshire and Northamptonshire were, as a rule, of the average size.

The Secretary stated that the Longicorn beetle exhibited at the last meeting, which had been sent from Birkenhead by Mr. David Henderson, had been identified by Mr. C. O. Waterhouse as *Monohammus titillatus* (Fab.), a species inhabiting the United States.

*Papers read.*

"On *Notiothauma Reedi*, a remarkable new Genus and Species of Neuroptera from Chili, pertaining to the Family *Panorpidae*," by R. M'Lachlan, F.R.S., &c.

"On the Lepidoptera of the Family *Lithosiidae* in the Collection of the British Museum," by Arthur G. Butler, F.L.S., F.Z.S., &c.—R. MELDOLA, *Hon. Sec.*

NOTICES OF NEW BOOKS.

*Notes on Fish and Fishing.* By J. J. MANLEY, M.A. Post 8vo, pp. 363, with Illustrations. London: Sampson Low & Co. 1877.

IF we except Shakespeare and his works, on no subject probably have more books been written than on Fish and Fishing. A complete catalogue of such works would fill a volume, and one would imagine that it must be extremely difficult, even to the most enthusiastic angler, with all his *quasi* discoveries, to say anything new on such a well-worn theme. Scientific ichthyologists have furnished us with the classification and natural history of the finny tribes; ardent fishermen have detailed their most successful modes of capture; enthusiastic lovers of nature have discoursed pleasantly of their rambles by lake and stream; and learned bibliographers have dived into all kinds of curious literature and brought to light many a quaint remark long buried in the literature of angling. The author of the book before us has not confined himself to any particular line of this sort. He

has fished much, and read more, making notes by the way, and the little volume which he now offers to his brother anglers and the public he describes as a selection of "notes" from his commonplace book on angling, and from the enormous mass of piscine and piscatorial memoranda and extracts which have gradually accumulated round him. These "notes" are, therefore, of a somewhat miscellaneous order, and if they do not always contain anything very new, they are presented to us not unfrequently in a new dress, and with comments by the author which deserve perusal. Indeed the chief merit of the book before us, in our opinion, lies in the comparisons which the author draws between his own experience and that of others who have written on the subject before him. He quotes older authors on various knotty points, narrates the result of his own experience, and endeavours to reconcile or account for the curious discrepancies which are occasionally to be met with in the published statements of enthusiastic fishermen.

His first note, headed "Ichthyology," deals with the classification of fish, and their structure; and various speculations are made as to whether fish hear, sleep, and feel pain. On these points, however, the author does not speak very positively, apparently not having made any original experiments in the matter, but contents himself for the most part with quoting the opposite opinions of others.

In his second note, "On the Literature of Fishing," which occupies between thirty and forty pages, a brief account is given of some of the most notable books on angling, the subject being divided under the heads of, "Authors before Izaak Walton," "Walton's Contemporaries," "Authors after Walton to end of 18th century," and "Authors from 1800 to the present time."

The merits of "Fishing as a Sport" may be taken to be so universally recognized and admitted at the present day that our author's third "note," under this heading, might have remained unpublished without at all detracting from the value of his book; but Mr. Manley, like many another enthusiast when riding his hobby, cannot resist a desire to indite a defence of his favourite field sport against every attack, real or imaginary, that can be made against it.

The same may almost be said of the note on "Fishing as a Fine Art," upon which so much has at various times been written. But

the progress of angling as an art has really been no greater than might have been expected, considering that amongst field sports it is the least expensive to indulge in, and consequently attracts the largest number of disciples. The more a subject is studied the more is art in connection with it likely to be developed.

Space will not permit us to notice in detail the dozen or more chapters which are devoted to as many different species of British fresh-water fish. Suffice it to say that Mr. Manley seems to have made personal acquaintance with them all, and at times to have been very successful in luring them to his creel. His notes on each, although somewhat discursive, are pleasantly written, and his illustrations of fish, in the style of those in Major's edition of Walton, although not so good, add much to the attractiveness of a very readable volume.

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*Sketches of Animal Life and Habits.* By ANDREW WILSON, Ph.D.,  
Lecturer on Zoology and Comparative Anatomy in the Medical  
School, Edinburgh. Post 8vo, pp. 208, with Illustrations.  
London and Edinburgh: W. & R. Chambers. 1877.

WE gather from the author's Preface that this series of Sketches has been compiled with the view of affording general readers, and especially the young, some popular and yet trustworthy ideas regarding some of the most interesting groups of the animal world. The work may, in fact, be regarded as a Natural History textbook, adapted for use in Nature's school at large, and as a guide to the use of the observant powers, through the due exercise of which all true ideas of Nature are acquired.

To give the reader a notion of the varied contents of the book we cannot do better than quote the headings of the different chapters, which are as follow:—"A peep at Animalcules;" "Life in the Depths;" "Concerning Sea-Anemones;" "Sea Eggs;" "A Gossip about Crabs;" "Shells and their Inmates;" "Butterflies of the Sea;" "Cuttle-fish Lore;" "Odd Fishes and their Common-place Neighbours;" "Curiosities of Insect Life;" "Curious Animal Companionships;" "Animal Disguises and Transformations;" "Animal Armouries;" and "Footprints on the Sands of Time."

Many of these chapters are extremely interesting. They are well illustrated, and, above all, possess the great merit of conveying accurate information, which is more than can be said of many so-called "popular" books. We should like to notice some of the chapters in detail, but the limited space at our disposal prevents us from doing more than cordially recommending the volume to the notice of naturalists.

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*Kindness to Animals: illustrated by Stories and Anecdotes: a Book for Home and School Reading.* Post 8vo, pp. 211. London and Edinburgh: W. & R. Chambers. 1877.

ALTHOUGH we have reason to believe that at the present day there is not so much reckless indifference to the sufferings of animals as formerly existed, there are nevertheless many persons who have little thought or regard for the pain which they cause or permit animals to endure. Horses are overworked and driven when lame; sheep and cattle are overdriven and left without water; dogs are neglected and left to wander without food about the streets; cats are shut up in houses or turned out of doors when families leave town for the autumn. These and many other cruelties are perpetrated, not always wantonly, or even intentionally, but for want of the exercise of a little thoughtful humanity.

Thanks to the efforts of the Royal Society for the Prevention of Cruelty to Animals, the law now takes cognizance of all wilful acts of cruelty which are brought to its notice, and offenders are duly punished whenever they are convicted.

But prevention is better than cure, and it is desirable to impress upon the young the duties incumbent upon them towards animals. Gentle treatment is usually rewarded by a return of affection; at the very least there is a satisfaction in seeing that the creatures dependent on us are happy. Even wild animals may be tamed, and will show their affection when treated with a kindly attention to their wants.

To impress these truths upon the young is the object of the book before us; and the stories and anecdotes which the writer has collected aptly illustrate the views which we have briefly expressed.

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